

*Workshop to Develop
Long-Term Global
Aeronautics Scenarios*

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Workshop to Develop Long-Term Global Aeronautics Scenarios

September 30 to October 2, 1996

Workshop to Develop Long-Term Global Aeronautics Scenarios

September 30 to October 2, 1996

Irvine, California

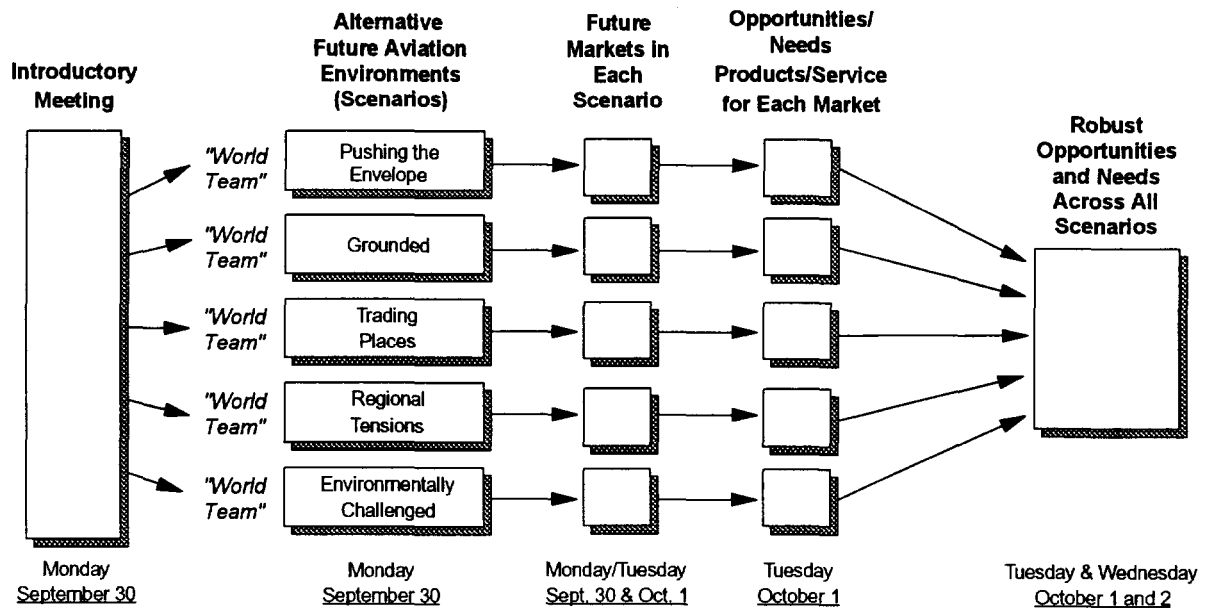
This Workshop

Scenario-based planning is a technique for managing uncertainty, not prediction. The planning horizon tends to be farther out in time (when ambiguity is greater) than conventional forecasting approaches. The intent is not to predict what the market will be and build a master plan; but, rather, to ask, "what might the future hold?" and identify the actions that can be taken today that will work no matter how the future turns out. As a result, the technique tends to rely more on expert judgment, and less on quantitative forecasts such as market size or share. Fundamentally, you are being asked to accept the scenario "future" you have been given – this **is** the way the world evolved. It is your job (and that of your scenario team mates) to insert your business judgment and expertise *into* this world and answer the question, "What should U.S. aeronautics do in this environment?" You will find this exercise is harder work than you might imagine. We also hope you will find that you are having some fun.

The three days of this workshop can be viewed as a funnel. We will begin the week looking very broadly at all aspects of the future aeronautics marketplace in five alternative scenarios. By Wednesday, we will have narrowed our focus to the robust actions necessary to address the few critical needs and opportunities important in most (or all) of the scenarios. For Monday and Tuesday, and part of Wednesday, most of you will be asked to "stay" in your worlds and help the ASEB Steering Committee understand the nuances of the opportunities and needs you have identified in each of your worlds. On Wednesday, we will begin the process of synthesizing the robust or resilient opportunities and needs derived from all the scenarios.

NASA Aeronautics Scenario Workshop

Task Flow September 30 - October 2



Workshop Schedule

Monday, September 30, 1996

Morning

8:00 to 9:30	Welcome and Opening Remarks Plenary Session	Mr. William Hoover ASEB Steering Committee Chairman Dr. Robert Whitehead NASA Associate Administrator for Aeronautics Mr. Robert Pearce NASA Aeronautics, Planning
--------------	--	---

9:30 to 9:45 Break

9:45 to 10:30	Introduction to Scenario Planning Plenary Session	Mr. Charles Thomas The Futures Group
---------------	--	--

10:30 to 11:00	Introduction to the Scenarios World Team Breakout Groups	Mr. Peter Kennedy Mr. Robert Avila Mr. Ken Sawka Dr. David Louscher Mr. Lee Lunsford The Futures Group
----------------	---	--

11:00 to 12:30 Scenario Analysis
World Team Breakout Groups

Pushing the Envelope Grounded Regional Tensions Trading Places Environmentally Challenged	Mr. Guy Bluford Mr. Jeff Schweitzer Mr. Robert Spitzer Ms. Grace Robertson Mr. Richard Golaszewski ASEB Steering Committee
---	--

Afternoon

12:30 to 1:15 Lunch

1:15 to 5:15 Scenario Analysis
World Team Breakout Groups

5:15 to 6:15	Report on First Day's Analysis <u>Plenary Session</u>	ASEB Steering Committee
--------------	--	-------------------------

6:15 to 6:30 Break

Evening

6:30 to 8:00 Dinner at the Beckman Center

Steering Committee Meeting

Morning

8:30 to 12:00 Scenario Analysis and Preparation of Presentation Material
World Team Breakout Group

12:00 to 12:30 NRC Executive Session

1:15 to 3:15	Brief Presentation of Opportunities and Needs for Each Scenario Plenary Session	World Team Leaders The Futures Group
--------------	--	---

3:30 to 4:30	Stress & Perturbation Test of Needs and Opportunities”: Round One <u>World Team Breakout Groups</u>	World Team Leaders
--------------	--	--------------------

4:30 to 5:30	Stress & Perturbation Test of Needs and Opportunities: Round Two World Team Breakout Groups	World Team Leaders
--------------	--	--------------------

Evening

5:45 to 6:45	Stress & Perturbation Test of Needs and Opportunities: Round Three <u>World Team Breakout Groups</u>	World Team Leaders
--------------	---	--------------------

Workshop to Develop Long-Term Global Aeronautics Scenarios

6:45 Participants are free to make their own dinner arrangements

Wednesday, October 2, 1996

Morning

8:00 to 8:30	Today's Agenda	Mr. William Hoover
8:30 to 9:30	Stress & Perturbation Test of Needs and Opportunities: Round Four <u>World Team Breakout Groups</u>	World Team Leaders
9:30 to 9:45	Break	
9:45 to 10:15	Discussion of Cross-Cutting Needs and Opportunities <u>Plenary Session</u>	Mr. William Heiser
10:15 to 10:45	Discussion of Technological Implications and Priorities of the Cross-Cutting Needs and Opportunities <u>Plenary Session</u>	Mr. Thomas Sheridan
10:45 to 11:00	Break	
11:00 to 12:15	Discuss NASA's Strategic Response to the Needs and Opportunities and Technological Implications <u>Plenary Session</u>	Mr. William Hoover
	Preparation of Cross-Scenario Analysis Summary Documents	NASA Core Team SAIC The Futures Group

Afternoon

12:15 to 1:00	Lunch	
1:00 to 4:30	Discuss and Reach Consensus on Prioritized needs and Opportunities and Technological Implications and Priorities <u>Plenary Session</u>	Mr. William Hoover
4:30 to 5:00	Adjourn <u>Plenary Session</u>	Mr. William Hoover

Using This Workbook

This workbook consists of a series of questions about your scenario. The questions are designed both to help you and your team immerse yourselves in “your future” and to help you identify the key opportunities and needs awaiting U.S. aeronautics in your scenario. Each world team is answering the same questions you are, which will facilitate cross-referencing among the scenario analyses. The answers to these questions will form the substance of your brief report-out on Monday afternoon and the 20-minute “conclusions presentation” on Tuesday after lunch. It also will be the reference guide to your analysis as your world team leader takes your conclusions on the stress and perturbation tests on Tuesday afternoon and Wednesday morning.

Scenario planning is all about being rigorous and systematic, while letting your imaginations work. The scenarios are intended to help you stay focused on the problem, but should never constrain you from “dreaming of the possibilities.” The questions in this workbook should be treated in a similar way. Let them guide you, but don’t let them constrain you. If there are issues or conclusions from your world that are keys to understanding the opportunities and challenges, but are not covered by the questions, please do not hesitate to add in that information.

Getting the Work Done

Most groups that become involved in scenario planning find that time flies as they think imaginatively but analytically about the opportunities and challenges that await them in a new future. You should have some fun with this process; we hope you do. Regrettably, however, there are certain deadlines. We have deliberately not suggested a timetable for the completion of each question. However, as a benchmark, we would suggest that you should be near the completion of Question 5 by the end of Monday. That will give you time on Tuesday morning to reflect on the analysis of the previous day and take a fresh look at the key opportunities and needs.

Questions for World Team Sessions

1. How does the consumer influence the marketplace around the world? What is the impact of lifestyle and cultural differences? Are there regional or national constraints or factors that influence consumer behavior? Within these considerations, how do consumers utilize global transportation? What does the aviation component look like? What does access to space look like?

2. Discuss the nature of general business activities around the world. How are they servicing their customers? What are the constraints on their behavior? How do businesses utilize global transportation? What does the aviation component look like? What does the access to space component look like?

3. Discuss the role of local, national, regional, and/or global governmental and regulatory authorities toward the transportation sector and the global aeronautics products and services industry.

4. Summarize how the global civilian aeronautics products and service industry operates.

5. What is the military security environment like? What is the impact of international or domestic terrorism? What is the role of the U.S. in dealing with international security? What is the role of the U.S. military? Describe the aeronautics component of that role. Describe the importance of access to space in that role.

6. Given your answers to the above questions, what are the needs and opportunities for the U.S. aeronautics products and services industry? The needs and opportunities should recognize national goals such as: maintain the superiority of U. S. aeronautics products and services by enhancing performance, efficiency, affordability, and survivability; achieve an efficient, safe, and affordable global air transportation system by improving capacity and efficiency and safety and security; ensure the long-term environmental compatibility of the aviation system. What are the technological implications of these needs and opportunities?

7. Now look beyond the time horizon of your world and speculate about possible innovations or breakthrough initiatives that you envision could change the nature of your world. Be creative with this question but stay true to a reasonable interpretation of how the future of your world might develop. What are the major obstacles that need to be overcome? Which of these can be addressed by advances in aeronautics or access to space? Is there an overriding need that cannot be ignored?

8. Describe the research and development activities that could address the technological implications of your world's global needs and opportunities. Prioritize these research and development activities. How is this research and development organized and conducted? What respective roles should the U.S. government, academia, and industry play? Please be certain to link your suggested R&D activity to specific opportunities or needs in your scenario.

Preparing Your Tuesday After Lunch Presentation Material

Introducing your future world to the other teams can be done using the briefing slides already produced by The Futures Group. Please focus most of your attention on the critical opportunities and needs list for your scenario, since that list will be the foundation of the work to follow. Those opportunities and needs must be written out individually on the scoring sheets that your world team leader has (sample on the next page). For the purposes of the brief presentation on Tuesday afternoon, you might consider just listing them on a few pages of easel pad. The same can be done for the answers to questions 7 and 8.

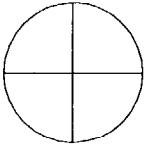
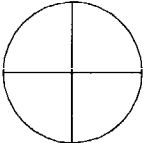
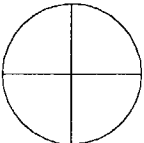
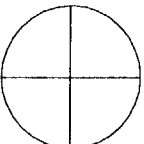
Downstream comparisons and analysis will be easier if you cluster your answers to questions 6, 7, and 8 according to the national goals categories on the System Benefit Framework matrix (sample after the scoring sheet sample).

- Maintain the Superiority of U. S. Aeronautical Products
- Achieve an Efficient, Safe, and Affordable Global Air Transportation System
- Ensure the Long-Term Environmental Compatibility of the Aviation System

The presentation should be about 20 minutes long. We recommend about a 5-minute introduction to the world (done by The Futures Group representative to your world) and about 15 minutes focusing on the answers to questions 6, 7, and 8.

Opportunities & Needs

from Environmentally Challenged

		Why This Score?	Rewrite for a Better Fit?
Pushing the Envelope			
Grounded			
Regional Tensions			
Trading Places			

System Benefit Framework for the National Goals

National Goals

	Maintain the Superiority of U.S. Aeronautical Products			Achieve an Efficient, Safe, and Affordable Global Air Transportation System		Ensure the Long-Term Environmental Compatibility of the Aviation System
System Benefits Vehicle/ Cust. Classes	Performance	Efficiency & Affordability	Survivability	Capability & Efficiency	Safety & Security	Environment
Rotorcraft						
Subsonic Transport						
High Speed Transport						
Airspace System						
General Aviation						
High Performance A/C						
Access to Space						

The Stress and Perturbation Test (Rounds One through Four)

During this exercise, most of you will stay in your breakout rooms. The team leaders from each of the other teams will visit your breakout room for one hour. They will spend some time reminding you what their world is like and presenting the opportunities and needs assessment from their future. It will be your job to evaluate the “goodness-of-fit” of those opportunities and needs in your scenario. This often requires a bit of back and forth conversation as you each learn the “whys” of each other’s worlds so that you can effectively evaluate whether an idea from another scenario might work in yours.

You will be asked to score the goodness of fit by filling in a circle (in quarter segments) or leaving it empty.

Empty Circle:	no relationship (no fit at all)
One Quarter filled in:	minimal overlap
One Half filled in:	overlap and potential application
Three Quarters filled in:	reasonably good fit, slight modification necessary
Full Circle:	very good fit, no significant alteration necessary

Next to each score that you give, you will be asked to answer two important questions:

- Why did you give this score? What was it about the characteristics of your world that made an opportunity or need from another scenario a good or poor “fit”?
- If the score was relatively high (half filled or better), how could you re-write the opportunity or need so that it has the best fit possible *without* destroying the intent of the team that originated it?

	Leader of Pushing the Envelope	Leader of Grounded	Leader of Regional Tensions	Leader of Trading Places	Leader of Environmentally Challenged
Pushing the Envelope Team		8:30 Wednesday	5:45 Tuesday	4:30 Tuesday	3:30 Tuesday
Grounded Team	3:30 Tuesday		8:30 Wednesday	5:45 Tuesday	4:30 Tuesday
Regional Tension Team	4:30 Tuesday	3:30 Tuesday		8:30 Wednesday	5:45 Tuesday
Trading Places Team	5:45 Tuesday	4:30 Tuesday	3:30 Tuesday		8:30 Wednesday
Environmentally Challenged Team	8:30 Wednesday	5:45 Tuesday	4:30 Tuesday	3:30 Tuesday	

This Scenario

This document describes one of five future alternative operating environments (scenarios) for the US aeronautics industry in 2020. All five scenarios were selected by the ASEB Steering Committee and NASA so that together they capture a broad range of opportunities and challenges. No single vision of the future can do that. The scenario you will be working with was designed to present a plausible backdrop for some of the wide variety of issues that had to be addressed. The first section is a narrative treatment of how the world evolved the way it did (a “future history”). The second section (the matrix) describes some specific aspects of the endstate (2015 to 2020) that are relevant to the aeronautics industry

Your first task in this scenario planning exercise will be to work with several other industry experts in a “world team” to identify the critical opportunities and challenges in your scenario only. Later in the workshop, the analysis results of all the teams will be synthesized as we capture those opportunities and needs that are robust across all five scenarios.

At the beginning of the conference on September 30 you will receive a workbook that will take you through the steps in this scenarios planning exercise. The central part of that workbook is a set of questions for you to answer with your “world team” as you seek to understand the aeronautics operating environment in your scenarios and identify critical aeronautics opportunities and needs.

As you read through the scenario before the conference, you may want to keep in mind the first questions in that workbook. Briefly:

“Describe the daily lifestyle of average consumers around the world. What are their life priorities? Within these priorities, what role does global transportation play?”

“Describe the nature of general business activities around the world. How are they servicing their customers? How do businesses utilize global transportation?”